

| FORM PTO-1449 (Modified)  |    |  | ATTY. DOCKET NO.<br>TH1647 05 (US) | APPLICATION NUMBER |       |          |                               |
|---|----|--|------------------------------------|--------------------|-------|----------|-------------------------------|
| LIST OF INFORMATION PROVIDED<br>BY APPLICANT<br>(Use several sheets if necessary) |    |  | APPLICANT<br>C. L. Edwards et al.  |                    |       |          |                               |
|   |    |  | FILING DATE                        | GROUP ART UNIT     |       |          |                               |
| REFERENCE DESIGNATION   |    |  | U.S. PATENT DOCUMENTS              |                    |       |          |                               |
| Examiner Initial  |    | Document No.   | Date                               | Patentee           | Class | Subclass | Filing Date<br>if Appropriate |
| <i>JW</i>   | AA | 3,676,523  | 7/11/72                            | Mason              | 260   | 683.15D  |                               |
| <i>JW</i>   | AB | 3,686,351  | 8/22/72                            | Mason              | 260   | 683.15D  |                               |
| <i>JW</i>   | AC | 3,737,475  | 6/5/73                             | Mason              | 260   | 683.15D  |                               |
| <i>JW</i>   | AD | 3,825,615  | 7/23/74                            | Lutz               | 260   | 683.15D  |                               |
| <i>JW</i>   | AE | 4,020,121  | 4/26/77                            | Kister et al.      | 260   | 683.15D  |                               |
| <i>JW</i>   | AF | 4,021,447  | 5/3/77                             | Rubin et al.       | 260   | 326.8    |                               |
| <i>JW</i>   | AG | 3,702,886  | 11/14/72                           | Argauer et al.     | 423   | 328      |                               |
| <i>JW</i>   | AH | 3,709,979  | 1/9/73                             | Chu                | 423   | 328      |                               |
| <i>JW</i>   | AI | 3,832,449  | 8/27/74                            | Rubin et al.       |       |          |                               |
| FOREIGN PATENT DOCUMENTS  |    |  |                                    |                    |       |          |                               |
|   |    | Document No.   | Date                               | Country            | Class | Subclass | Translation<br>Yes No         |
| <i>W</i>  | AL | WO 94/05761  | 3/17/94                            | World              | C11D  | 3/10     |                               |
| <i>W</i>  | AM | 1,429,143  | 3/24/76                            | Great Britain      | C11D  | 10/02    |                               |
| <i>W</i>  | AN | WO 99/42553  | 8/26/99                            | World              | C11D  | 3/43     |                               |
| <i>W</i>  | AO | 0,884,298 A2   | 12/16/98                           | Europe             | C07C  | 43/10    | X                             |
| OTHER DOCUMENTS (INCLUDING AUTHOR, TITLE, DATE, PERTINENT PAGES, ETC.)            |    |  |                                    |                    |       |          |                               |
| <i>W</i>  | AR | Myers, Drew, "Surfactant Science and Technology," pp. 82-85, VCH Publishers, Inc. (New York, NY, USA) 1988 (ISBN 0-89573-399-0)                        |                                    |                    |       |          |                               |
| <i>W</i>  | AS | K. Shinoda, "Principles of Solution and Solubility," translation in collaboration with Paul Becher, published by Mercel Dekker, Inc. 1978, pp. 292-304 |                                    |                    |       |          |                               |
| <i>W</i>  | AT | Reid, V.W., G.F. Longman and E. Heinrich, "Determination of Anionic-Active Detergents by Two-Phase Titration," <u>Tensile</u> 4, 1967, pp. 292-304     |                                    |                    |       |          |                               |
| EXAMINER  |    |  | DATE CONSIDERED                    |                    |       |          |                               |
| <i>Jean P. Holloman</i>   |    |  | <i>April 16/2014</i>               |                    |       |          |                               |

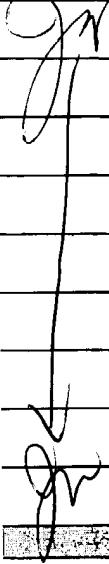
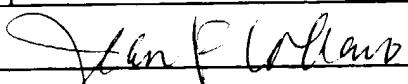
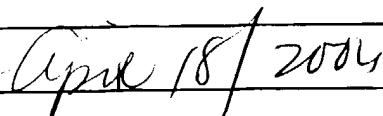
EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

1. The attached cited information should not be construed as an admission that any of the above items are prior art to the subject invention.
2. This is not a representation that a search has been made.

| FORM PTO-1449 (Modified)   |    |  | ATTY. DOCKET NO.<br>TH1647 05 (US) | APPLICATION NUMBER |       |          |                               |
|--|----|--|------------------------------------|--------------------|-------|----------|-------------------------------|
| LIST OF INFORMATION PROVIDED<br>BY APPLICANT                           |    |  | APPLICANT<br>C. L. Edwards et al.  |                    |       |          |                               |
| (Use several sheets if necessary)                                      |    |  | FILING DATE                        | GROUP ART UNIT     |       |          |                               |
| REFERENCE DESIGNATION  |    |  | U.S. PATENT DOCUMENTS              |                    |       |          |                               |
| Examiner Initial   |    | Document Number  | Date                               | Patentee           | Class | Subclass | Filing Date<br>If Appropriate |
|  | BA | 4,482,531  | 11/13/84                           | Kuehl              | 423   | 329      |                               |
|  | BB | 3,950,496  | 4/13/76                            | Ciric              | 423   | 328      |                               |
|  | BC | 3,972,983  | 8/3/76                             | Ciric              | 423   | 328      |                               |
|  | BD | 4,046,859  | 9/6/77                             | Plank et al.       | 423   | 328      |                               |
|  | BE | 4,247,416  | 1/27/81                            | Doherty et al.     | 252   | 428      |                               |
|  | BF | 4,086,186  | 4/25/78                            | Rubin et al.       | 252   | 430      |                               |
|  | BG | 4,046,859  | 9/6/77                             | Plank et al.       | 423   | 328      |                               |
|  | BH | 4,287,166  | 9/1/81                             | Dwyer et al.       | 423   | 325      |                               |
|  | BI | 4,247,728  | 1/27/81                            | Rubin et al.       | 585   | 467      |                               |
| FOREIGN PATENT DOCUMENTS   |    |  |                                    |                    |       |          | Translation<br>Yes      No    |
|  |    | Document Number  | Date                               | Country            | Class | Subclass | Translation<br>Yes      No    |
|  | BL | 06073045   | 3/15/94                            | Japan              | C07D  | 273/08   | X                             |
|  | BM | 03261779   | 11/21/91                           | Japan              | C07D  | 309/24   | X                             |
|  | BN | JP 11-349507   | 12/21/99                           | Japan              | C07C  | 43/11    | X                             |
|  | BO | 100 20 899 A1  | 10/25/01                           | Germany            | C07D  | 493/04   | X                             |
| OTHER DOCUMENTS (INCLUDING AUTHOR, TITLE, DATE, PERTINENT PAGES, ETC.) |    |  |                                    |                    |       |          |                               |
|  | BR | B. E. Gordon, H. Roddewig and W. T. Shebs, "A Double Label Radiotracer Approach to Detergency Studies," Journal of American Oil Chemists' Society, Vol. 44, No. 5 (1967) pp. 289-294 |                                    |                    |       |          |                               |
|  | BS | W. T. Shebs and B. E. Gordon, "Improvements in Detergency Precision With Radioactive Soil," Journal of American Oil Chemists' Society, Vol. 45, No. 5 (1968) pp. 377-380             |                                    |                    |       |          |                               |
|  | BT | W. T. Shebs, "Radioisotope Techniques in Detergency," Chapter 3, <u>Detergency Theory and Technology</u> , Marcel Dekker, Inc., New York (1987) pp. 125-191                          |                                    |                    |       |          |                               |
| EXAMINER   |    |  | DATE CONSIDERED                    |                    |       |          |                               |

EXAMINER: Initial if citation considered, whether citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

1. The attached cited information should not be construed as an admission that any of the above items are prior art to the subject invention.
2. This is not a representation that a search has been made.

|   |   |  |                                    |                    |       |   |                               |
|---|---|--|------------------------------------|--------------------|-------|---|-------------------------------|
| FORM PTO-1449 (Modified)  |   |  | ATTY. DOCKET NO.<br>TH1647 05 (US) | APPLICATION NUMBER |       |   |                               |
| LIST OF INFORMATION PROVIDED<br>BY APPLICANT<br><br>(Use several sheets if necessary) |   |  | APPLICANT<br>C. L. Edwards et al.  |                    |       |   |                               |
|   |   |  | FILING DATE                        | GROUP ART UNIT     |       |   |                               |
| REFERENCE DESIGNATION   |   | U.S. PATENT DOCUMENTS  |                                    |                    |       |   |                               |
| Examiner Initial  |   | Document No.   | Date                               | Patentee           | Class | Subclass  | Filing Date<br>If Appropriate |
|      | CA  | 4,495,303  | 1/22/85                            | Kuehl              | 502   | 62  |                               |
|   | CB  | 4,397,827  | 8/9/83                             | Chu                | 423   | 326   |                               |
|   | CC  | 4,640,829  | 2/3/87                             | Rubin              | 423   | 328   |                               |
|   | CD  | 4,568,654  | 2/4/86                             | Valyocsik          | 502   | 62  |                               |
|   | CE  | 4,698,217  | 10/6/87                            | Valyocsik          | 423   | 328C  |                               |
|   | CF  | 4,647,442  | 3/3/87                             | Derouane et al.    | 423   | 306   |                               |
|   | CG  | 4,619,818  | 10/28/86                           | Derogane et al.    | 423   | 306   |                               |
|   | CH  | 4,954,325  | 9/4/90                             | Rubin et al.       | 423   | 328   |                               |
|   | CI  | 5,236,575  | 8/17/93                            | Bennett et al.     | 208   | 46  |                               |
| FOREIGN PATENT DOCUMENTS  |   |  |                                    |                    |       |   |                               |
|   |   | Document No.   | Date                               | Country            | Class | Subclass  | Translation<br>Yes N          |
|   | CL  |  |                                    |                    |       |   |                               |
|   | CM  |  |                                    |                    |       |   |                               |
|   | CN  |  |                                    |                    |       |   |                               |
|   | CO  |  |                                    |                    |       |   |                               |
| OTHER DOCUMENTS (INCLUDING AUTHOR, TITLE, DATE, PERTINENT PAGES, ETC.)                |   |  |                                    |                    |       |   |                               |
|     | CR  | Roger Hunter et al., "Allylation Using Allylborates," TETRAHEDRON, Vol. 50, No. 3, 1994, pp. 871-888   |                                    |                    |       |   |                               |
|   | CS  | Birgit Bartels et al., "A Selectivity of Activated Ketal Reduction With Borane Dimethyl Sulfide," JOURNAL OF ORGANIC CHEMISTRY, Vol. 58, No. 24, 1993, pp. 6756-6765   |                                    |                    |       |   |                               |
|   | CT  | T. Hosokawa et al., "Palladium (II)-Catalyzed Acetalization of Terminal Olefins Bearing Electron-Withdrawing Substituents With Optically Active Diols," JOURNAL OF ORGANIC CHEMISTRY, Vol. 52, 1987, pp. 1958-1764 |                                    |                    |       |   |                               |
| EXAMINER  |  |  | DATE CONSIDERED                    |                    |       |  |                               |

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

1. The attached cited information should not be construed as an admission that any of the above items are prior art to the subject invention.
2. This is not a representation that a search has been made.

| FORM PTO-1449 (Modified)   |                      |   | ATTY. DOCKET NO.<br>TH1647 05 (US)       | APPLICATION NUMBER |       |          |                            |
|--|----------------------|---|--|--------------------|-------|----------|----------------------------|
| LIST OF INFORMATION PROVIDED<br>BY APPLICANT                           |                      |   | APPLICANT<br>C. L. Edwards et al.        |                    |       |          |                            |
| (Use several sheets if necessary)                                      |                      |   | FILING DATE                              | GROUP ART UNIT     |       |          |                            |
| REFERENCE DESIGNATION  |                      |   | U.S. PATENT DOCUMENTS                    |                    |       |          |                            |
| Examiner Initial   |                      | Document Number   | Date                                     | Patentee           | Class | Subclass | Filing Date if Appropriate |
| <i>JW</i>  | DA                   | 3,308,069   | 3/7/67                                   | Wadlinger et al.   | 252   | 455      |                            |
|  | DB                   | Re. 28,341  | 2/18/75                                  | Wadlinger, et al.  | 208   | 120      |                            |
|  | DC                   | 3,058,805   | 10/16/62                                 | Weber              | 23    | 113      |                            |
|  | DD                   | 3,130,007   | 4/21/64                                  | Breck              | 23    | 113      |                            |
|  | DE                   | 3,996,337   | 12/7/76                                  | Stabenow et al.    | 423   | 328      |                            |
|  | DF                   | 4,440,871   | 4/3/84                                   | Lok et al.         | 502   | 214      |                            |
|  | DG                   | 5,059,567   | 10/22/91                                 | Linsten et al.     | 502   | 64       |                            |
| <i>JW</i>  | DH                   | 3,462,525   | 8/19/69                                  | Levinsky           | 424   | 56       |                            |
|  | DI                   | 3,428,654   | 2/18/69                                  | Rubinfeld et al.   | 260   | 327      |                            |
| FOREIGN PATENT DOCUMENTS   |                      |   |  |                    |       |          |                            |
|  |                      | Document Number   | Date                                     | Country            | Class | Subclass | Translation<br>Yes      No |
|  | DL                   |   |  |                    |       |          |                            |
|  | DM                   |   |  |                    |       |          |                            |
|  | DN                   |   |  |                    |       |          |                            |
|  | DO                   |   |  |                    |       |          |                            |
| OTHER DOCUMENTS (INCLUDING AUTHOR, TITLE, DATE, PERTINENT PAGES, ETC.) |                      |   |  |                    |       |          |                            |
| <i>JW</i>  | DR                   | F. Wang et al., Synlett, (1998) pp. 245-245               |  |                    |       |          |                            |
| <i>JW</i>  | DS                   | A. A. Volkov et al., Dokl. Chem. 283, (1985), pp. 246-248 |  |                    |       |          |                            |
|  | DT                   | International Search Report of 5 July 2002                |  |                    |       |          |                            |
| EXAMINER   | <i>John Flanagan</i> |   | DATE CONSIDERED<br><i>April 18, 2004</i> |                    |       |          |                            |

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

1. The attached cited information should not be construed as an admission that any of the above items are prior art to the subject invention.
2. This is not a representation that a search has been made.

| FORM PTO-1449 (Modified)  |                             |  | ATTY. DOCKET NO.<br>TH1647 05 (US) | APPLICATION NUMBER |                       |          |                            |
|---|-----------------------------|--|------------------------------------|--------------------|-----------------------|----------|----------------------------|
| LIST OF INFORMATION PROVIDED<br>BY APPLICANT<br><br>(Use several sheets if necessary) |                             |  | APPLICANT<br>C. L. Edwards et al.  |                    |                       |          |                            |
|   |                             |  | FILING DATE                        | GROUP ART UNIT     |                       |          |                            |
| REFERENCE DESIGNATION   |                             |  | U.S. PATENT DOCUMENTS              |                    |                       |          |                            |
| Examiner Initial  |                             | Document Number  | Date                               | Patentee           | Class                 | Subclass | Filing Date if Appropriate |
| <i>JW</i>   | EA                          | 3,420,875  | 1/7/69                             | Di Salvo et al.    | 260                   | 513      |                            |
|   | EB                          | 3,506,580  | 4/14/70                            | Rubinfeld et al.   | 252                   | 138      |                            |
|   | EC                          | 3,579,537  | 5/18/71                            | Rubinfeld et al.   | 260                   | 327      |                            |
|   | ED                          | 3,524,864  | 8/18/70                            | Rubinfeld et al.   | 260                   | 327      |                            |
|   | EE                          | 5,057,627  | 10/15/91                           | Edwards            | 568                   | 618      |                            |
|   | EF                          | 6,087,311  | 7/11/00                            | Van Dijk           | 510                   | 294      |                            |
|   | EG                          | 6,083,893  | 7/4/00                             | Zint et al.        | 510                   | 221      |                            |
| <i>JW</i>   | EH                          | 6,159,920  | 12/12/00                           | Ridyard            | 510                   | 324      |                            |
|   | EI                          | 6,153,574  | 11/28/00                           | Janssen            | 510                   | 224      |                            |
| FOREIGN PATENT DOCUMENTS  |                             |  |                                    |                    |                       |          |                            |
|   |                             | Document Number  | Date                               | Country            | Class                 | Subclass | Translation<br>Yes      No |
|   | EL                          |  |                                    |                    |                       |          |                            |
|   | EM                          |  |                                    |                    |                       |          |                            |
|   | EN                          |  |                                    |                    |                       |          |                            |
|   | EO                          |  |                                    |                    |                       |          |                            |
| OTHER DOCUMENTS (INCLUDING AUTHOR, TITLE, DATE, PERTINENT PAGES, ETC.)                |                             |  |                                    |                    |                       |          |                            |
| <i>JW</i>   | ER                          | Anionic Surfactants, Volume 7, Part I, edited by Warner M. Linfield, 1976 by Marcel Dekker, Inc. |                                    |                    |                       |          |                            |
|   | ES                          |  |                                    |                    |                       |          |                            |
|   | ET                          |  |                                    |                    |                       |          |                            |
| EXAMINER  | <i>Opps. J. L. Williams</i> |  | DATE CONSIDERED                    |                    | <i>April 18, 2021</i> |          |                            |

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

1. The attached cited information should not be construed as an admission that any of the above items are prior art to the subject invention.
2. This is not a representation that a search has been made.

|   |  |                                    |                    |
|---|--|------------------------------------|--------------------|
| FORM PTO-1449 (Modified)  |  | ATTY. DOCKET NO.<br>TH1647 05 (US) | APPLICATION NUMBER |
| LIST OF INFORMATION PROVIDED<br>BY APPLICANT<br>(Use several sheets if necessary) |  | APPLICANT<br>C. L. Edwards et al.  |                    |
|   |  | FILING DATE                        | GROUP ART UNIT     |

| REFERENCE DESIGNATION |    | U.S. PATENT DOCUMENTS |          |                |       |          |                            |
|-----------------------|----|-----------------------|----------|----------------|-------|----------|----------------------------|
| Examiner Initial      |    | Document No.          | Date     | Patentee       | Class | Subclass | Filing Date If Appropriate |
| JM                    | FA | 2,778,855             | 1/22/57  | Shokal et al.  | 260   | 613      |                            |
|                       | FB | 4,503,275             | 3/5/85   | Harris et al.  | 568   | 866      |                            |
|                       | FC | 4,317,938             | 3/2/82   | Lutz           | 568   | 619      |                            |
|                       | FD | 4,721,816             | 1/26/88  | Edwards        | 568   | 618      |                            |
|                       | FE | 4,721,817             | 1/26/88  | Edwards        | 518   | 618      |                            |
|                       | FF | 2,808,442             | 10/1/57  | Smith et al.   | 260   | 611      |                            |
|                       | FG | 5,912,408             | 6/15/99  | Trinh et al.   | 8     | 142      |                            |
| CH                    | FH | 4,544,512             | 10/1985  | Hozumi et al.  | 558   | 169      |                            |
|                       | FI | Ser. No. 10/025,080   | 12/19/01 | Edwards et al. |       |          |                            |

|  |    | FOREIGN PATENT DOCUMENTS |      |         |       |          | Translation |    |
|--|----|--------------------------|------|---------|-------|----------|-------------|----|
|  |    | Document No.             | Date | Country | Class | Subclass | Yes         | No |
|  | FL |                          |      |         |       |          |             |    |
|  | FM |                          |      |         |       |          |             |    |
|  | FN |                          |      |         |       |          |             |    |
|  | FO |                          |      |         |       |          |             |    |

| OTHER DOCUMENTS (INCLUDING AUTHOR, TITLE, DATE, PERTINENT PAGES, ETC.) |    |  |
|--|----|--|
|  | FR |  |
|  | FS |  |
|  | FT |  |

|          |                  |                 |
|----------|------------------|-----------------|
| EXAMINER | Jean F. Holloman | DATE CONSIDERED |
|----------|------------------|-----------------|

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

1. The attached cited information should not be construed as an admission that any of the above items are prior art to the subject invention.
2. This is not a representation that a search has been made.